



10905 - The Dynamic State of the Dwarf Galaxy Rich Canes Venatici I Region

Cycle: 15, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
02	(2) KUG-1207+367	WFPC2	2	17-Jan-2008 15:39:44.0	yes
04	(4) NGC-4190	WFPC2	2	17-Jan-2008 15:39:48.0	yes
05	(5) CGCG-269-049	WFPC2	2	17-Jan-2008 15:39:51.0	yes
06	(6) UGC-07356	ACS/WFC	1	17-Jan-2008 15:39:54.0	yes
07	(7) IC-3308	WFPC2	1	17-Jan-2008 15:39:56.0	yes
08	(8) NGC-4395	ACS/WFC	1	17-Jan-2008 15:39:59.0	yes
09	(9) UGCA-281	ACS/WFC	1	17-Jan-2008 15:40:02.0	yes

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
11	(11) UGC-07599	ACS/WFC	1	17-Jan-2008 15:40:04.0	yes
12	(12) UGC-07698	WFPC2	2	17-Jan-2008 15:40:07.0	yes
13	(13) UGCA-292	ACS/WFC	1	17-Jan-2008 15:40:09.0	yes
14	(14) LEDA-166142	WFPC2	2	17-Jan-2008 15:40:11.0	yes
15	(15) NGC-4789A	ACS/WFC	1	17-Jan-2008 15:40:14.0	yes
16	(16) MESSIER-064	ACS/WFC	1	17-Jan-2008 15:40:16.0	yes
18	(18) UGC-08331	ACS/WFC	1	17-Jan-2008 15:40:19.0	yes
19	(19) NGC-5238	ACS/WFC	1	17-Jan-2008 15:40:21.0	yes
20	(20) HOLMBERG-IV	ACS/WFC	1	17-Jan-2008 15:40:24.0	yes
61	(21) UGC-07599-COPY	WFPC2	2	17-Jan-2008 15:40:26.0	yes

23 Total Orbits Used

ABSTRACT

With accurate distances, the nearest groups of galaxies can be resolved in 3 dimensions and the radial component of the motions of galaxies due to local density perturbations can be distinguished from cosmological expansion components. Currently, with the ACS, galaxy distances within 8 Mpc can be measured effectively and efficiently by detecting the tip of the red giant branch (TRGB). Of four principal groups at high galactic latitude in this domain, the Canes Venatici I Group (a) is the least studied, (b) is the most populated, though overwhelmingly by dwarf galaxies, and (c) is likely the least dynamically evolved. It is speculated that galaxies in low mass groups may fail to retain baryons as effectively as those in high mass groups, resulting in significantly higher mass-to-light ratios. The CVn I Group is suspected to lie in the mass regime where the speculated astrophysical processes that affect baryon retention are becoming important.

OBSERVING DESCRIPTION

There was little discussion of the TRGB methodology in the scientific justification because the general idea is becoming well known and the value of HST for this sort of work is becoming appreciated. At least for low metallicity systems, expected to be present in all the targets in this proposal, the Red Giant Branch terminates abruptly at $M_I = -4.0$ (Da Costa & Armandroff 1990). This feature can be satisfactorily distinguished if the RGB is sampled adequately at least 1 mag fainter than the tip.

Photometric errors explode in the last magnitude before the detection limit so empirically we find that the tip should be >2 mag brighter than the $s/n=3$ detection limit for an unbiased distance estimate. The crowded field photometry is done using an updated version of HSTPHOT (Dolphin 2000) tailored for use with ACS (called 'DOLPHOT'). The location of the TRGB can be established either with the Sobel edge-detection algorithm (Sakai et al. 1996) or a maximum likelihood method (Mendez et al. 2002; Makarov et al. 2006).

Most of our targets are smaller than the field offered by ACS so we will observe the whole galaxy in these cases. Inevitably the dwarf systems that are our targets are low surface brightness and do not present a problem with crowding that compromises our photometry.

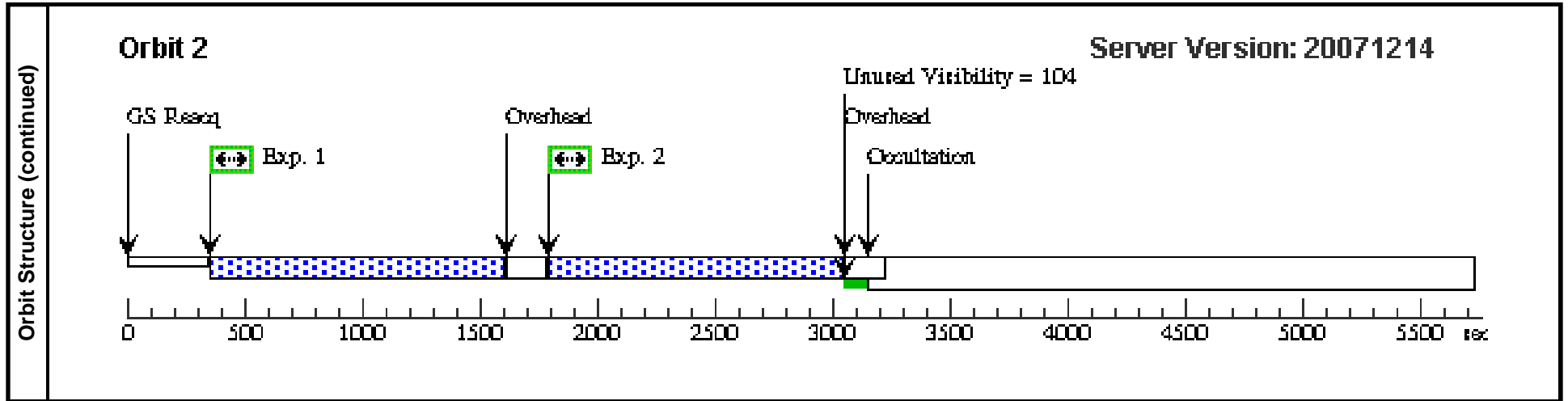
In the few cases where the galaxy is larger than the ACS field of view we will select a location that avoids confusion with crowding and contributions from young stellar populations.

It can be seen in the color-magnitude diagrams of Fig.1 that contamination

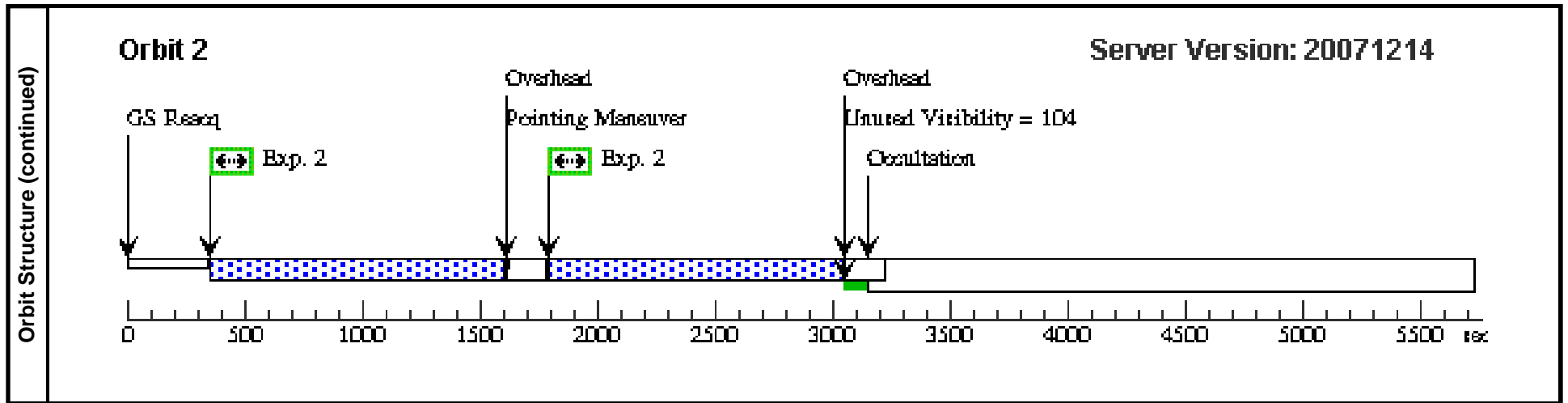
by young populations is commonly a problem but that the RGB always stands out if the observations are sufficiently deep (ie, extend >2 mag fainter than the tip). It is to be emphasized that the data shown in Fig.1 were not spatially filtered to avoid regions with young populations. If only parts of the target galaxies that are distant from star formation are considered then the confusion from irrelevant populations is sharply reduced. However there can still be problems with Asymptotic Giant Branch stars in the Red Tail above and redward of the TRGB. We are actively studying the issue of discrimination between RGB and AGB stars (Makarov et al. 2006). In any event there is now enough experience to show that the TRGB can be satisfactorily isolated.

The primary requirement is to obtain satisfactory sensitivity in the I band with the F814W filter. Observations that translate to V are needed to provide color discrimination. We will use the F606W filter which has proven to give acceptable V magnitudes and provides substantially more sensitivity for red stars than the F555W filter. Integrations will be 1000s, cr-split, in the F814W and 1200s, cr-split, in the F606W filter, both obtained in a single HST orbit. These integrations will reach $I \sim 27.5$ and $V \sim 28$ with $s/n \sim 3$. For a galaxy at 7 Mpc the TRGB would lie the desired 2 mag above the faint cutoff. All our targets are expected to be well within this distance. Our most difficult observations will produce results comparable in quality to what is seen in the bottom right panel of Fig.1.

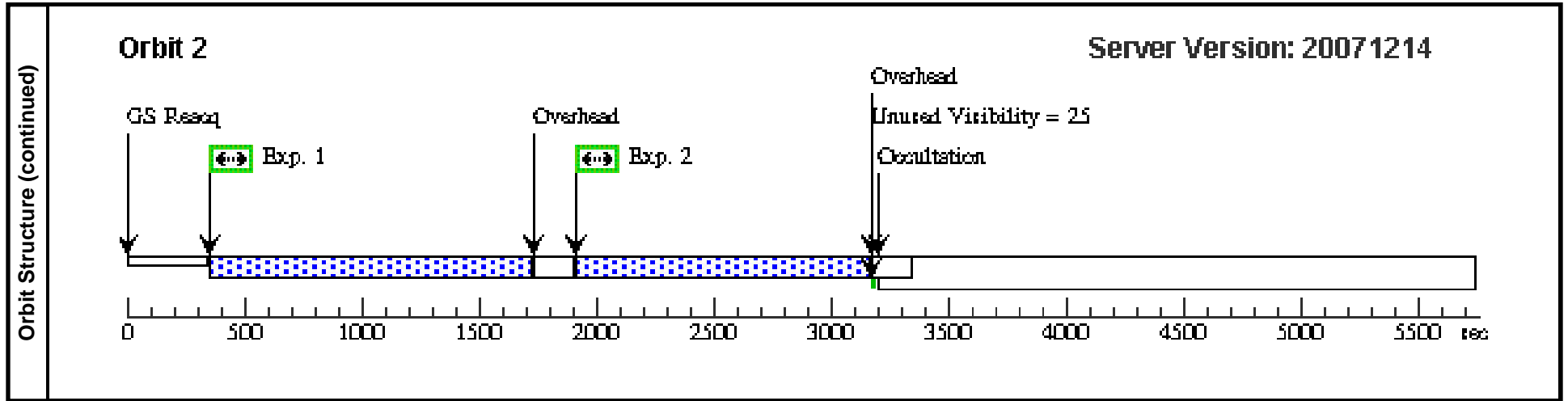
Visit	Proposal 10905, Visit 02, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: (none)										
	Patterns	#	Primary Pattern					Secondary Pattern			Exposures
(2)		Pattern Type=WFPC2-LINE		Coordinate Frame=POS-TARG						(1-2)	
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections		Fluxes		Miscellaneous	
	(2)	KUG-1207+367	RA: 12 09 56.5000 (182.4854167d) Dec: +36 26 4.00 (36.43444d) Equinox: J2000					V=25		Reference Frame: NED	
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1	(2) KUG-1207+367	WFPC2, IMAGE, WF3	F814W	CR-SPLIT=NO		Pattern 1-2 (2)	1100.0 Secs			
									[=>(Pattern 1)]		[1]
									[=>(Pattern 2)]		[2]
2	(2) KUG-1207+367	WFPC2, IMAGE, WF3	F606W	CR-SPLIT=NO		Pattern 1-2 (2)	1100.0 Secs				
									[=>(Pattern 1)]		[1]
									[=>(Pattern 2)]		[2]
Orbit Structure	<p>Orbit 1 Server Version: 20071214</p> <p>Pointing Maneuver Overhead Unused Visibility = 104 Occultation</p> <p>GS Acq Expt. 1 Overhead Expt. 2</p> <p>0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 sec.</p>										



Visit	Proposal 10905, Visit 04, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: (none)											
	Patterns	#	Primary Pattern					Secondary Pattern			Exposures	
(2)		Pattern Type=WFPC2-LINE		Coordinate Frame=POS-TARG						(1), (2)		
		Purpose=DITHER		Pattern Orientation=45.0								
		Number Of Points=2		Angle Between Sides=								
		Point Spacing=0.3535		Center Pattern=false								
		Line Spacing=										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(4)	NGC-4190	RA: 12 13 44.7000 (183.4362500d) Dec: +36 38 3.00 (36.63417d) Equinox: J2000					V=25		Reference Frame: NED		
Exposures	#	Label	Target	Config,Mode,Aperture		Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1	(4) NGC-4190	WFPC2, IMAGE, WF3	F814W		CR-SPLIT=NO			Pattern 1-1 (2)	1100.0 Secs		
										[=>(Pattern 1)]		[1]
										[=>(Pattern 2)]		
2	(4) NGC-4190	WFPC2, IMAGE, WF3	F606W		CR-SPLIT=NO			Pattern 2-2 (2)	1100.0 Secs			
									[=>(Pattern 1)]		[2]	
									[=>(Pattern 2)]			
Orbit Structure	<p>Orbit 1 Server Version: 20071214</p> <p>Unused Visibility = 104</p> <p>The diagram shows a horizontal timeline from 0 to 5500 seconds. A blue dotted bar represents the primary visibility period, starting at approximately 400 seconds and ending at 3100 seconds. Key events are marked with arrows: 'GS Acq' at ~200s, 'Exp. 1' (in a green box) at ~400s, 'Pointing Maneuver Overhead' at ~1600s, 'Exp. 1' (in a green box) at ~1800s, 'Pointing Maneuver Overhead' at ~3000s, and 'Occultation' at ~3100s. A green bar at the bottom indicates a period of 'Unused Visibility' from ~3100s to ~3200s. The total duration of the orbit is 5500 seconds.</p>											



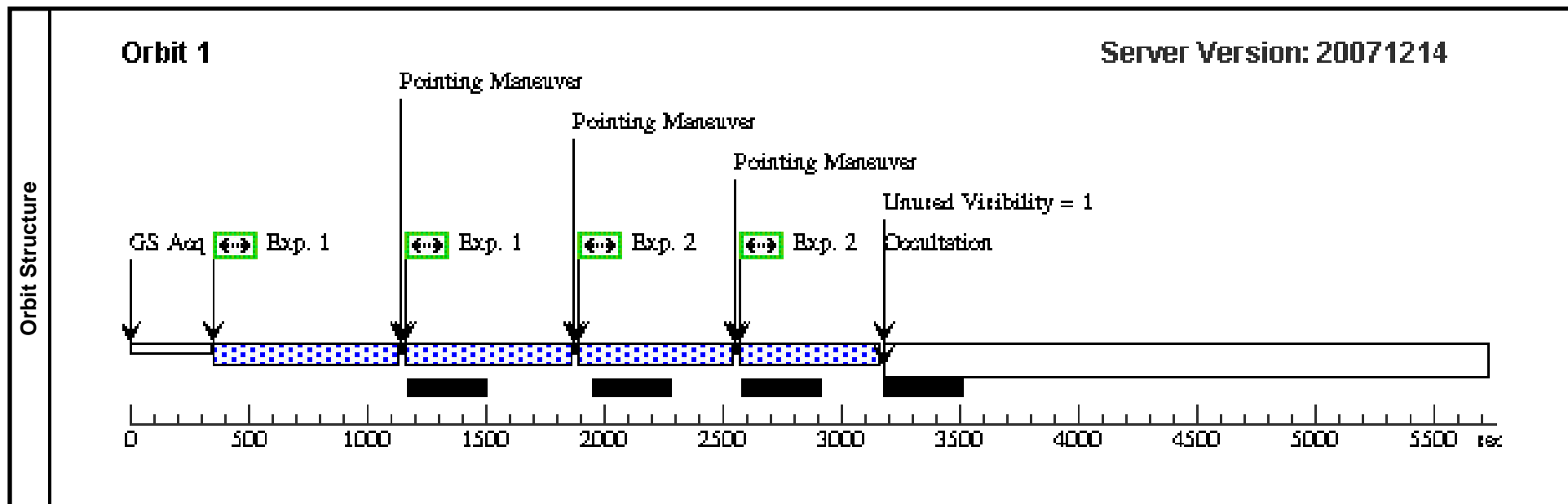
Visit	Proposal 10905, Visit 05, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: (none)										
	Patterns	#	Primary Pattern					Secondary Pattern			Exposures
(2)		Pattern Type=WFPC2-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.3535 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=45.0 Angle Between Sides= Center Pattern=false							(1-2)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(5)	CGCG-269-049	RA: 12 15 46.8000 (183.9450000d) Dec: +52 23 17.00 (52.38806d) Equinox: J2000				V=25	Reference Frame: NED			
<i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1	(5) CGCG-269-049	WFPC2, IMAGE, WF3	F814W	CR-SPLIT=NO		Pattern 1-2 (2)	1200.0 Secs			
								[=>(Pattern 1)]	[1]		
								[=>(Pattern 2)]	[2]		
2	(5) CGCG-269-049	WFPC2, IMAGE, WF3	F606W	CR-SPLIT=NO		Pattern 1-2 (2)	1100.0 Secs				
							[=>(Pattern 1)]	[1]			
							[=>(Pattern 2)]	[2]			
Orbit Structure	Orbit 1 Server Version: 20071214										



Proposal 10905 - Visit 06 - The Dynamic State of the Dwarf Galaxy Rich Canes Venatici I Region

Thu Jan 17 20:40:31 GMT 2008

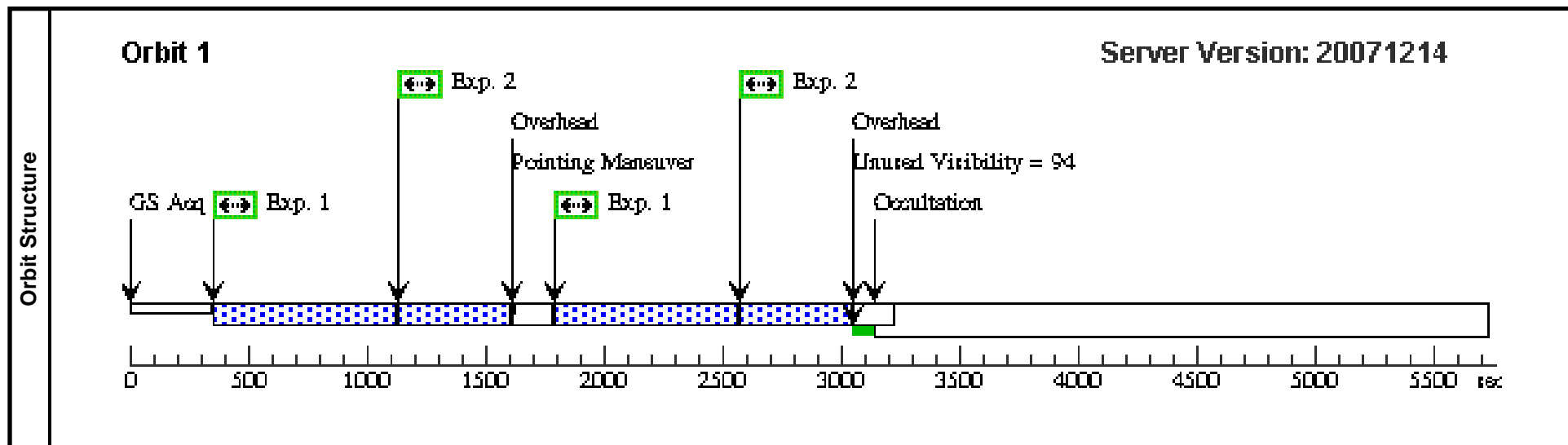
Visit	Proposal 10905, Visit 06, completed Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
(1)		Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.146 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=47.17 Angle Between Sides= Center Pattern=false					(1), (2)		
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(6)	UGC-07356	RA: 12 19 9.1000 (184.7879167d) Dec: +47 05 23.00 (47.08972d) Equinox: J2000			V=25	Reference Frame: NED			
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(6) UGC-07356	(6) UGC-07356	ACS/WFC, ACCUM, WFC1	F814W	CR-SPLIT=NO		Pattern 1-1 (1)	574.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	
2	(6) UGC-07356	(6) UGC-07356	ACS/WFC, ACCUM, WFC1	F606W	CR-SPLIT=NO			Pattern 2-2 (1)	469.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	



Proposal 10905 - Visit 07 - The Dynamic State of the Dwarf Galaxy Rich Canes Venatici I Region

Thu Jan 17 20:40:31 GMT 2008

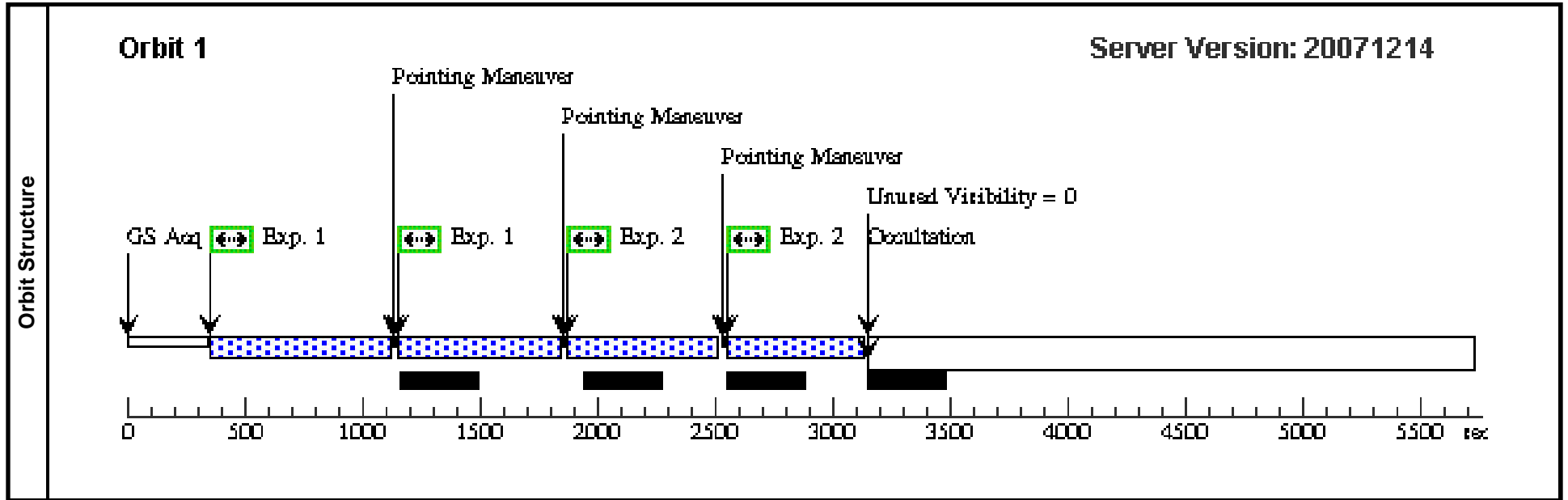
Visit	Proposal 10905, Visit 07, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: ORIENT 260.0D TO 260.0 D										
	Patterns	#	Primary Pattern				Secondary Pattern			Exposures	
(2)		Pattern Type=WFPC2-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.3535 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=45.0 Angle Between Sides= Center Pattern=false						(1-2)		
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous					
	(7)	IC-3308	RA: 12 25 18.2000 (186.3258333d) Dec: +26 42 54.00 (26.71500d) Equinox: J2000		V=25	Reference Frame: NED					
<i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1	(7) IC-3308	WFPC2, IMAGE, WF3	F814W	CR-SPLIT=NO			Pattern 1-2 (2)	500.0 Secs		
										[=>(Pattern 1)]	[1]
										[=>(Pattern 2)]	
2	(7) IC-3308	WFPC2, IMAGE, WF3	F606W	CR-SPLIT=NO				Pattern 1-2 (2)	400.0 Secs		
									[=>(Pattern 1)]	[1]	
									[=>(Pattern 2)]		



Proposal 10905 - Visit 08 - The Dynamic State of the Dwarf Galaxy Rich Canes Venatici I Region

Thu Jan 17 20:40:32 GMT 2008

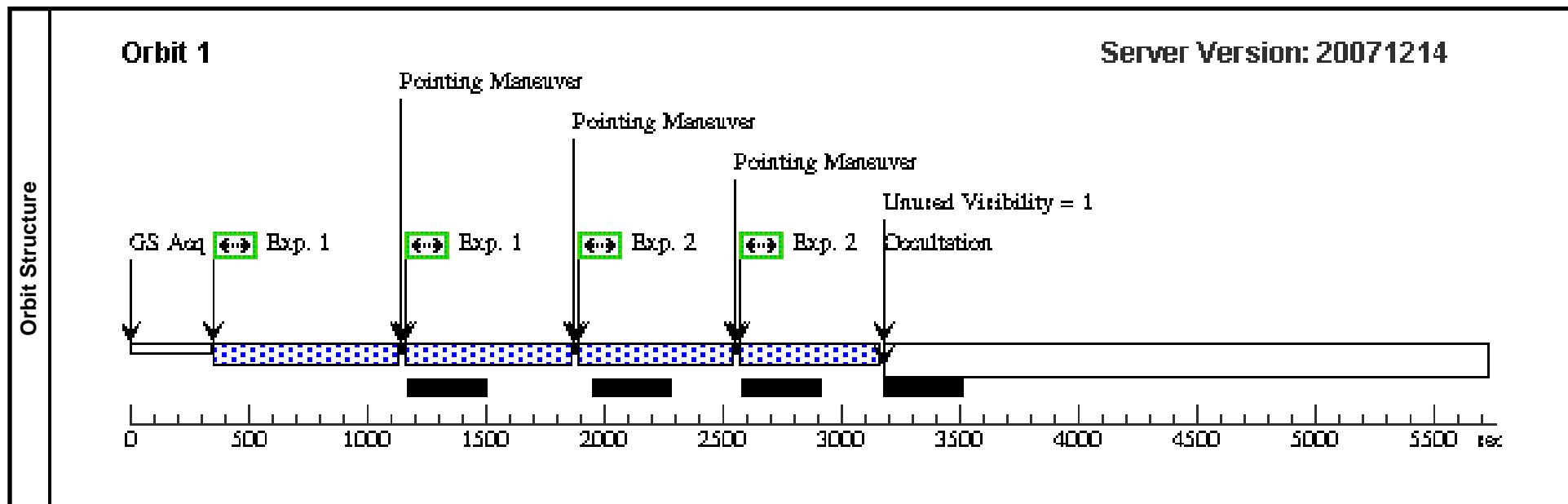
Visit	Proposal 10905, Visit 08, completed Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
(1)		Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.146 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=47.17 Angle Between Sides= Center Pattern=false					(1), (2)		
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(8)	NGC-4395	RA: 12 25 48.9000 (186.4537500d) Dec: +33 32 48.00 (33.54667d) Equinox: J2000 <i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>		V=25	Reference Frame: NED				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(8) NGC-4395	(8) NGC-4395	ACS/WFC, ACCUM, WFC	F814W	CR-SPLIT=NO		Pattern 1-1 (1)	565.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	
2	(8) NGC-4395	(8) NGC-4395	ACS/WFC, ACCUM, WFC	F606W	CR-SPLIT=NO			Pattern 2-2 (1)	463.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	



Proposal 10905 - Visit 09 - The Dynamic State of the Dwarf Galaxy Rich Canes Venatici I Region

Thu Jan 17 20:40:32 GMT 2008

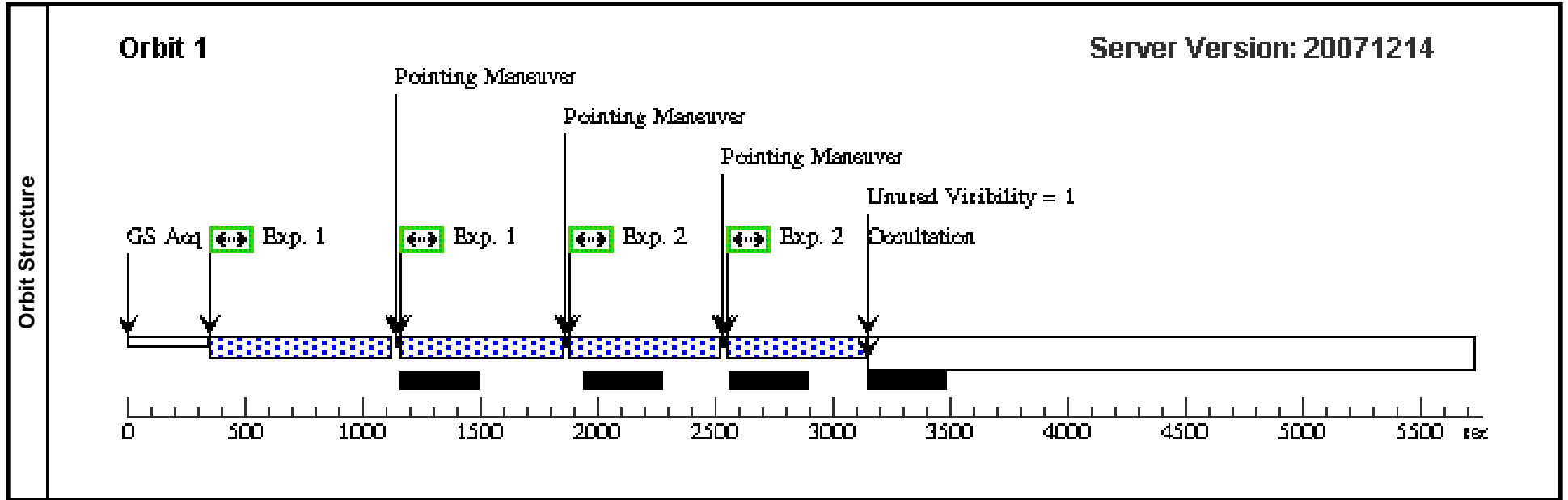
Visit	Proposal 10905, Visit 09, completed Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
(1)		Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.146 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=47.17 Angle Between Sides= Center Pattern=false					(1), (2)		
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(9)	UGCA-281	RA: 12 26 16.0000 (186.5666667d) Dec: +48 29 37.00 (48.49361d) Equinox: J2000			V=25	Reference Frame: NED			
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(9) UGCA-281	(9) UGCA-281	ACS/WFC, ACCUM, WFC1	F814W	CR-SPLIT=NO		Pattern 1-1 (1)	574.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	
2	(9) UGCA-281	(9) UGCA-281	ACS/WFC, ACCUM, WFC1	F606W	CR-SPLIT=NO			Pattern 2-2 (1)	469.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	



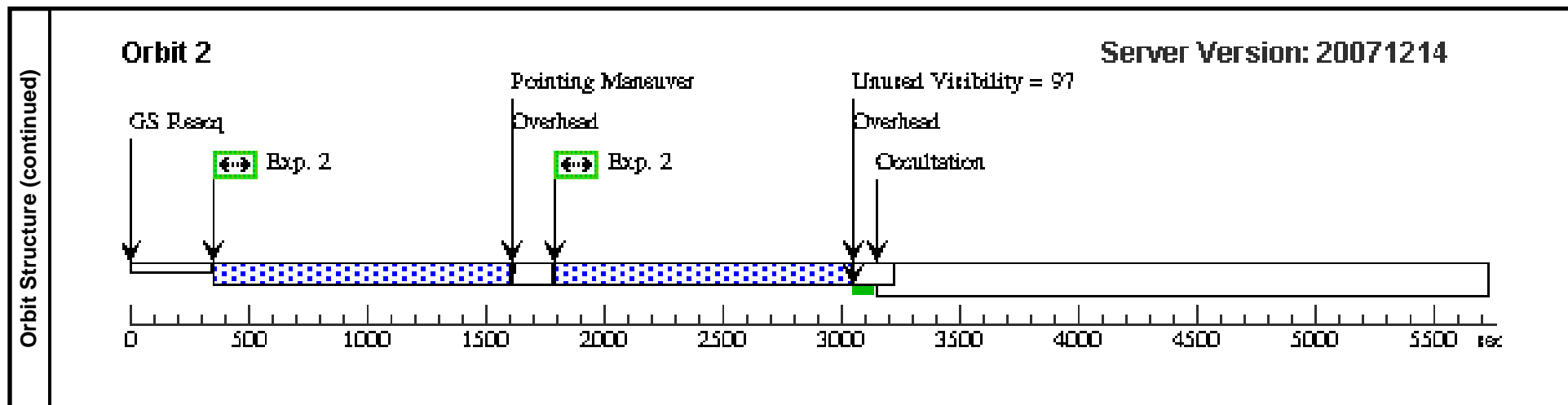
Proposal 10905 - Visit 11 - The Dynamic State of the Dwarf Galaxy Rich Canes Venatici I Region

Thu Jan 17 20:40:32 GMT 2008

Visit	Proposal 10905, Visit 11, failed Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: ORIENT 55.0D TO 335.0 D									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
(1)		Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.146 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=47.17 Angle Between Sides= Center Pattern=false					(1), (2)		
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(11)	UGC-07599	RA: 12 28 28.5000 (187.1187500d) Dec: +37 14 1.00 (37.23361d) Equinox: J2000 Comments: This object was generated by the targetselector and retrieved from the NED database.		V=25	Reference Frame: NED				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(11) UGC-07599	(11) UGC-07599	ACS/WFC, ACCUM, WFC1	F814W	CR-SPLIT=NO		Pattern 1-1 (1)	567.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	
2	(11) UGC-07599	(11) UGC-07599	ACS/WFC, ACCUM, WFC1	F606W	CR-SPLIT=NO			Pattern 2-2 (1)	464.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	

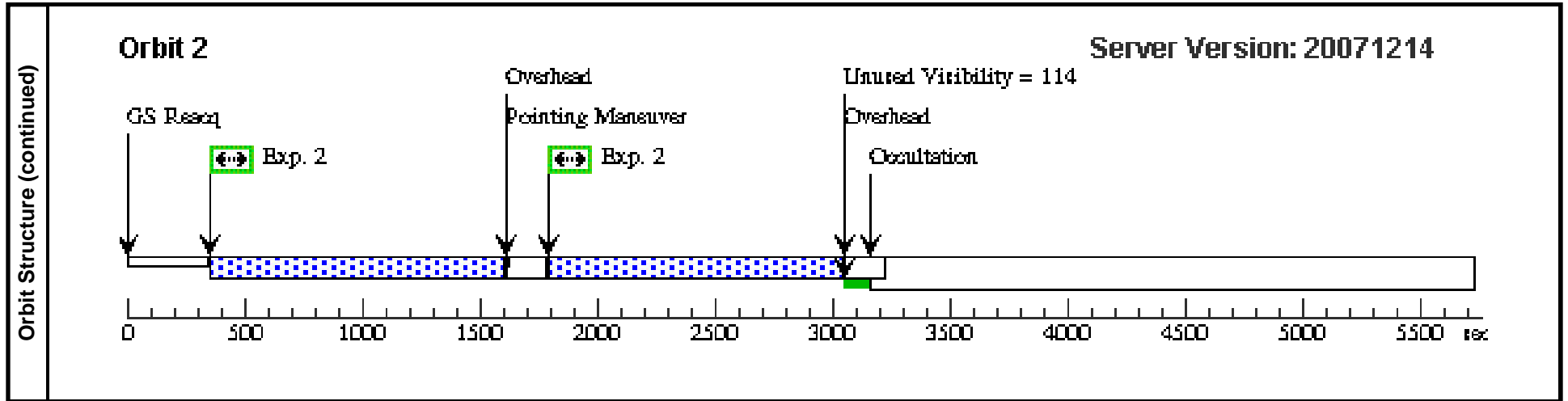


Visit	Proposal 10905, Visit 12, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
(2)		Pattern Type=WFPC2-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.3535 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=45.0 Angle Between Sides= Center Pattern=false		(1), (2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(12)	UGC-07698	RA: 12 32 54.4000 (188.2266667d) Dec: +31 32 28.00 (31.54111d) Equinox: J2000		V=25	Reference Frame: NED				
<i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(12) UGC-07698	WFPC2, IMAGE, WF3	F814W	CR-SPLIT=NO			Pattern 1-1 (2)	1100.0 Secs	
									[=>(Pattern 1)] [=>(Pattern 2)]	[1]
2	(12) UGC-07698	WFPC2, IMAGE, WF3	F606W	CR-SPLIT=NO				Pattern 2-2 (2)	1100.0 Secs	
									[=>(Pattern 1)] [=>(Pattern 2)]	[2]
Orbit Structure	<p>Orbit 1 Server Version: 20071214</p> <p>Unused Visibility = 97</p> <p>The diagram illustrates the orbit structure over a 5500-second period. It shows a sequence of events: GS Acq (Green Arrow) at ~200s, followed by Exp. 1 (Green Arrow) at ~400s. A blue hatched bar indicates the exposure period from ~400s to ~1600s. A Pointing Maneuver (Vertical Arrow) occurs at ~1600s, followed by an Overhead period. Another Exp. 1 (Green Arrow) occurs at ~1800s, with a blue hatched bar extending to ~3000s. A second Pointing Maneuver (Vertical Arrow) occurs at ~3000s, followed by another Overhead period. An Occultation (Vertical Arrow) occurs at ~3100s. The orbit ends at ~5500s. The total unused visibility is 97 seconds.</p>									
	<p>Timeline labels: GS Acq, Exp. 1, Pointing Maneuver, Overhead, Occultation.</p> <p>Timeline scale: 0, 500, 1000, 1500, 2000, 2500, 3000, 3500, 4000, 4500, 5000, 5500 sec.</p>									



Visit	Proposal 10905, Visit 13, completed Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: ORIENT 302.0D TO 302.0 D										
	Patterns	#	Primary Pattern				Secondary Pattern				Exposures
(1)		Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.146 Line Spacing=		Coordinate Frame=POS-TARG Pattern Orientation=47.17 Angle Between Sides= Center Pattern=false						(1)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(13)	UGCA-292	RA: 12 38 40.0000 (189.6666667d) Dec: +32 46 1.00 (32.76694d) Equinox: J2000				V=25	Reference Frame: NED			
<i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>											
Exposures	#	Label	Target	Config,Mode,Aperture		Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(13) UGCA-292	ACS/WFC, ACCUM, WFC1		F606W	CR-SPLIT=NO		Pattern 1-1 (1)	463.0 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]
Orbit Structure	Orbit 1 Server Version: 20071214										
	<p>The diagram illustrates the orbit structure over a 5500-second period. Key events are marked with vertical arrows: GS Acq at ~300s, Exp. 1 at ~400s, Pointing Maneuver at ~1000s, another Exp. 1 at ~1100s, and Occultation at ~3100s. A blue checkered bar represents the primary exposure period from ~300s to ~1600s. A green bar represents the secondary exposure period from ~1600s to ~3100s. A black bar at the bottom indicates the occultation period from ~3100s to ~5500s. The text 'Unused Visibility = 1497' is placed between the pointing maneuver and the occultation.</p>										

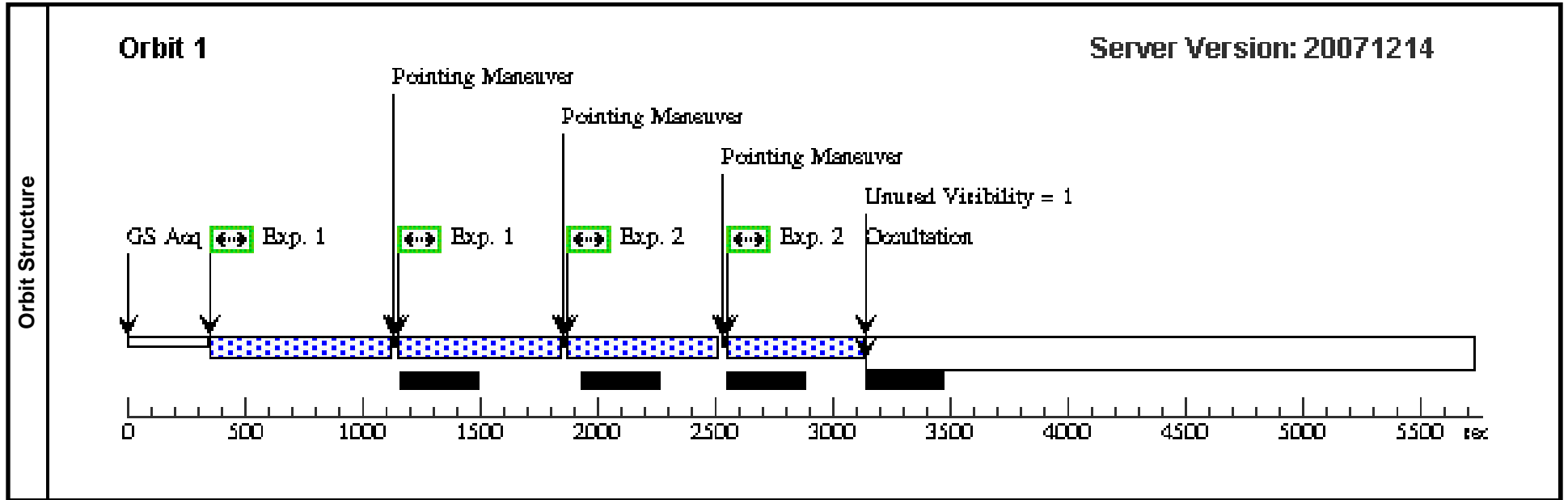
Visit	Proposal 10905, Visit 14, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: (none)										
	Patterns	#	Primary Pattern					Secondary Pattern			Exposures
(2)		Pattern Type=WFPC2-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.3535 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=45.0 Angle Between Sides= Center Pattern=false						(1), (2)		
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(14)	LEDA-166142	RA: 12 43 57.3000 (190.9887500d) Dec: +43 39 43.00 (43.66194d) Equinox: J2000					V=25		Reference Frame: NED	
<i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1	(14) LEDA-166142	WFPC2, IMAGE, WF3	F814W	CR-SPLIT=NO			Pattern 1-1 (2)	1100.0 Secs		
										[=>(Pattern 1)] [=>(Pattern 2)]	[1]
2	(14) LEDA-166142	WFPC2, IMAGE, WF3	F606W	CR-SPLIT=NO			Pattern 2-2 (2)	1100.0 Secs			
									[=>(Pattern 1)] [=>(Pattern 2)]	[2]	
Orbit Structure	<p>Orbit 1 Server Version: 20071214</p> <p>The diagram shows a horizontal timeline from 0 to 5500 seconds. Key events are marked with arrows: GS Acq at ~200s, Exp. 1 (green box) at ~400s, Overhead and Pointing Maneuver at ~1600s, another Exp. 1 (green box) at ~1800s, Overhead and Pointing Maneuver at ~3000s, and Occultation at ~3100s. A blue dotted bar represents the observation period from ~400s to ~3100s. A green bar at the end of the timeline indicates unused visibility of 114 seconds.</p>										
	<p>Timeline labels: GS Acq, Exp. 1, Overhead, Pointing Maneuver, Occultation, Unused Visibility = 114.</p> <p>X-axis: 0, 500, 1000, 1500, 2000, 2500, 3000, 3500, 4000, 4500, 5000, 5500 sec.</p>										



Proposal 10905 - Visit 15 - The Dynamic State of the Dwarf Galaxy Rich Canes Venatici I Region

Thu Jan 17 20:40:34 GMT 2008

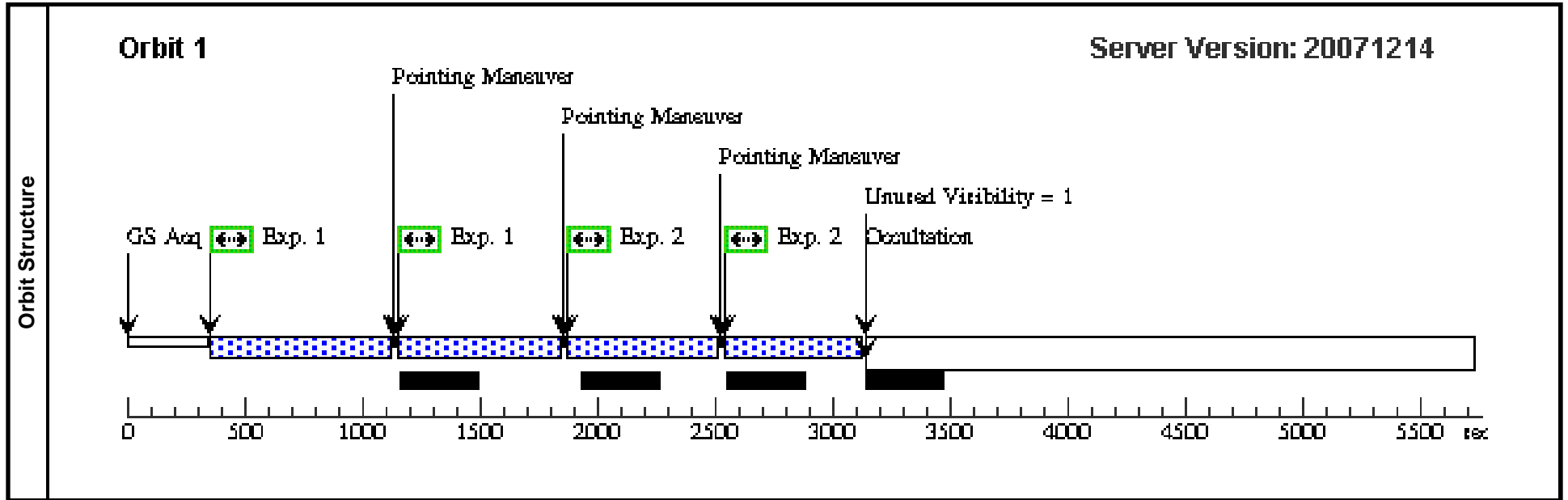
Visit	Proposal 10905, Visit 15, completed Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
(1)		Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.146 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=47.17 Angle Between Sides= Center Pattern=false					(1), (2)		
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(15)	NGC-4789A	RA: 12 54 5.2000 (193.5216667d) Dec: +27 08 59.00 (27.14972d) Equinox: J2000 <i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>		V=25	Reference Frame: NED				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(15) NGC-4789A	(15) NGC-4789A	ACS/WFC, ACCUM, WFC1	F814W	CR-SPLIT=NO		Pattern 1-1 (1)	564.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	
2	(15) NGC-4789A	(15) NGC-4789A	ACS/WFC, ACCUM, WFC1	F606W	CR-SPLIT=NO			Pattern 2-2 (1)	462.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	



Proposal 10905 - Visit 16 - The Dynamic State of the Dwarf Galaxy Rich Canes Venatici I Region

Thu Jan 17 20:40:34 GMT 2008

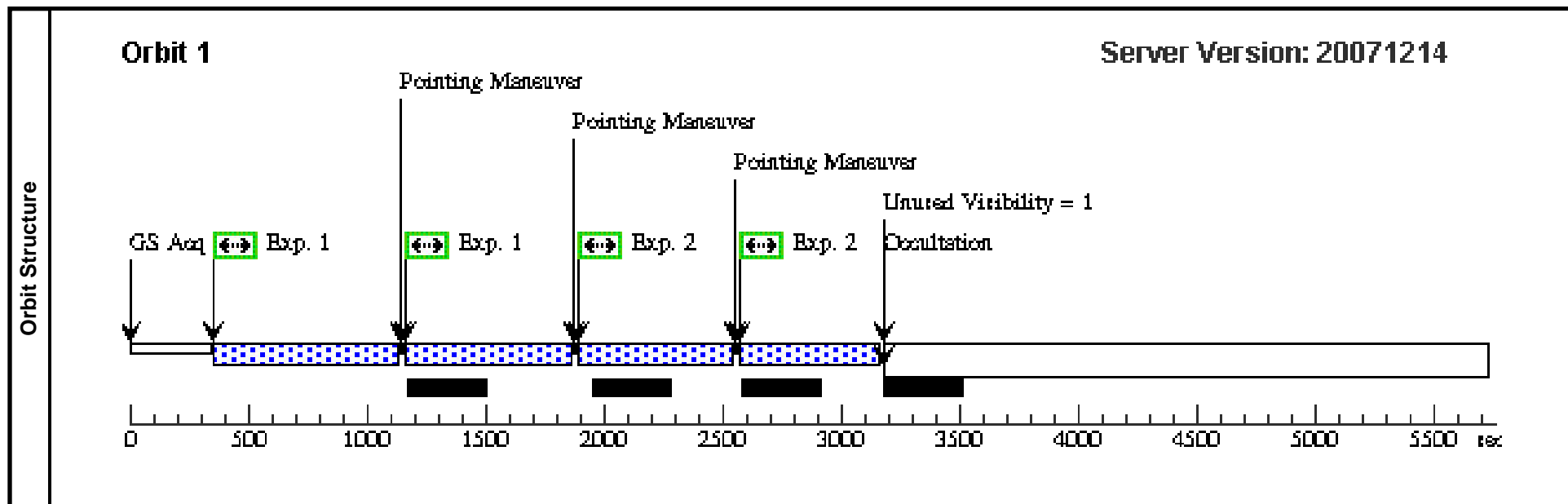
Visit	Proposal 10905, Visit 16, completed Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
(1)		Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.146 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=47.17 Angle Between Sides= Center Pattern=false					(1), (2)		
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(16)	MESSIER-064	RA: 12 56 58.6000 (194.2441667d) Dec: +21 39 12.00 (21.65333d) Equinox: J2000 <i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>		V=25	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(16) MESSIER-064	ACS/WFC, ACCUM, WFC	F814W	CR-SPLIT=NO			Pattern 1-1 (1)	564.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	
2	(16) MESSIER-064	ACS/WFC, ACCUM, WFC	F606W	CR-SPLIT=NO				Pattern 2-2 (1)	461.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	



Proposal 10905 - Visit 18 - The Dynamic State of the Dwarf Galaxy Rich Canes Venatici I Region

Thu Jan 17 20:40:35 GMT 2008

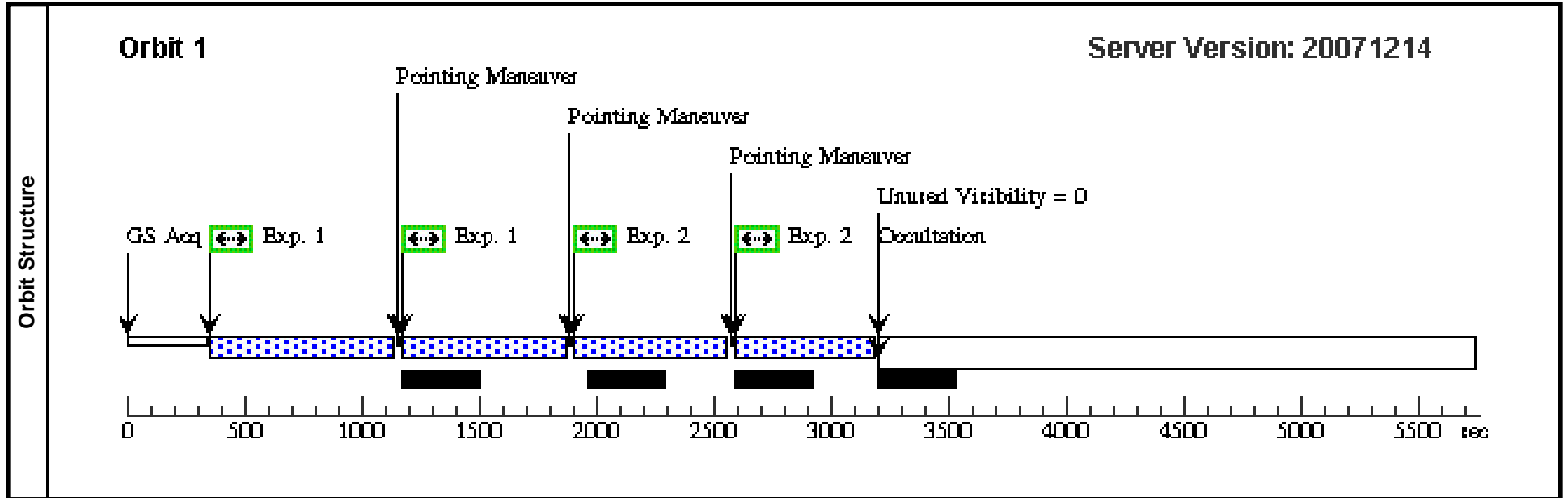
Visit	Proposal 10905, Visit 18, completed Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
(1)		Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.146 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=47.17 Angle Between Sides= Center Pattern=false					(1), (2)		
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(18)	UGC-08331	RA: 13 15 30.3000 (198.8762500d) Dec: +47 29 56.00 (47.49889d) Equinox: J2000 <i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>			V=25	Reference Frame: NED			
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(18) UGC-08331	(18) UGC-08331	ACS/WFC, ACCUM, WFC1	F814W	CR-SPLIT=NO		Pattern 1-1 (1)	574.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	
2	(18) UGC-08331	(18) UGC-08331	ACS/WFC, ACCUM, WFC1	F606W	CR-SPLIT=NO			Pattern 2-2 (1)	469.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	



Proposal 10905 - Visit 19 - The Dynamic State of the Dwarf Galaxy Rich Canes Venatici I Region

Thu Jan 17 20:40:35 GMT 2008

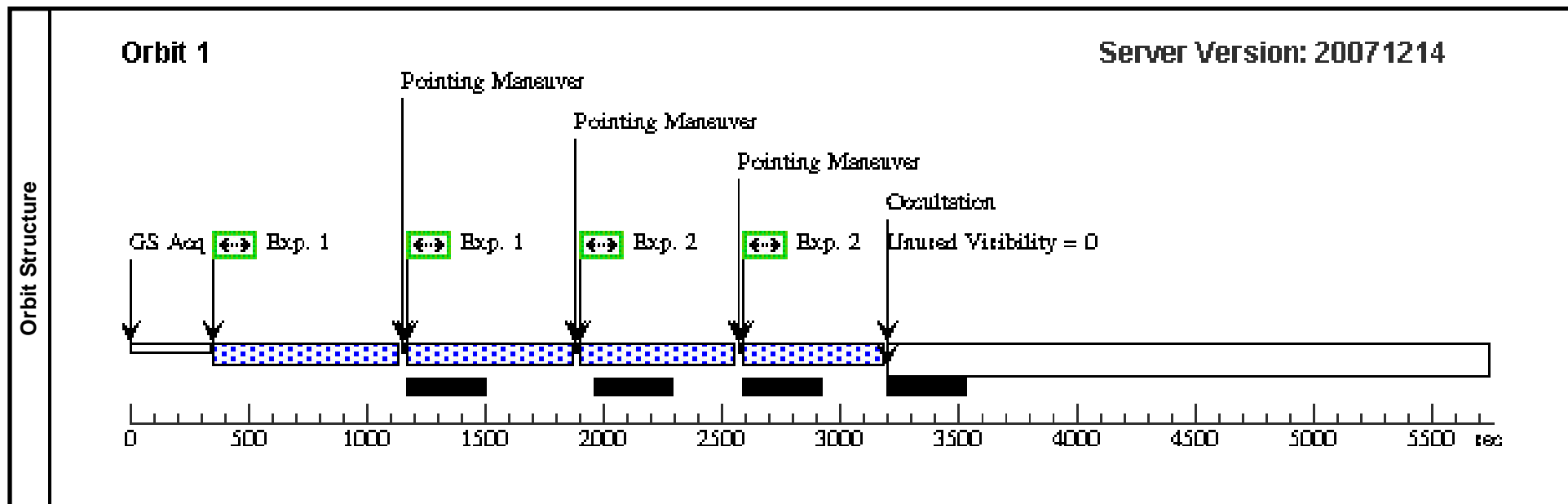
Visit	Proposal 10905, Visit 19, completed Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
(1)		Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.146 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=47.17 Angle Between Sides= Center Pattern=false					(1), (2)		
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(19)	NGC-5238	RA: 13 34 42.5000 (203.6770833d) Dec: +51 36 49.00 (51.61361d) Equinox: J2000 <i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>		V=25	Reference Frame: NED				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(19) NGC-5238	(19) NGC-5238	ACS/WFC, ACCUM, WFC1	F814W	CR-SPLIT=NO		Pattern 1-1 (1)	579.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	
2	(19) NGC-5238	(19) NGC-5238	ACS/WFC, ACCUM, WFC1	F606W	CR-SPLIT=NO			Pattern 2-2 (1)	473.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	



Proposal 10905 - Visit 20 - The Dynamic State of the Dwarf Galaxy Rich Canes Venatici I Region

Thu Jan 17 20:40:35 GMT 2008

Visit	Proposal 10905, Visit 20, completed Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
(1)		Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.146 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=47.17 Angle Between Sides= Center Pattern=false					(1), (2)		
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(20)	HOLMBERG-IV	RA: 13 54 45.7000 (208.6904167d) Dec: +53 54 3.00 (53.90083d) Equinox: J2000 Comments: This object was generated by the targetselector and retrieved from the NED database.		V=25	Reference Frame: NED				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(20) HOLMBERG-I V	ACS/WFC, ACCUM, WFC	F814W	CR-SPLIT=NO		Pattern 1-1 (1)	579.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	
2		(20) HOLMBERG-I V	ACS/WFC, ACCUM, WFC	F606W	CR-SPLIT=NO			Pattern 2-2 (1)	473.0 Secs	
									[=>(Pattern 1)]	[1]
									[=>(Pattern 2)]	



Visit	Proposal 10905, Visit 61, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFPC2 Special Requirements: ORIENT 55.0D TO 335.0 D										
	Patterns	#	Primary Pattern				Secondary Pattern		Exposures		
(2)		Pattern Type=WFPC2-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.3535 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=45.0 Angle Between Sides= Center Pattern=false					(1-2)			
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(21)	UGC-07599-COPY	RA: 12 28 28.5000 (187.1187500d) Dec: +37 14 1.00 (37.23361d) Equinox: J2000				V=25	Reference Frame: NED			
<i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit	
	1		(21) UGC-07599-CO PY	WFPC2, IMAGE, WF3	F814W	CR-SPLIT=NO		Pattern 1-2 (2)	1100.0 Secs		
									[=>(Pattern 1)]	[1]	
									[=>(Pattern 2)]	[2]	
2		(21) UGC-07599-CO PY	WFPC2, IMAGE, WF3	F606W	CR-SPLIT=NO		Pattern 1-2 (2)	1100.0 Secs			
								[=>(Pattern 1)]	[1]		
								[=>(Pattern 2)]	[2]		
Orbit Structure	<p>Orbit 1 Server Version: 20071214</p> <p>Unused Visibility = 104</p> <p>The diagram shows a horizontal timeline from 0 to 5500 seconds. A blue dotted bar represents the active observation period, starting at approximately 400 seconds and ending at 3100 seconds. Key events are marked with arrows: 'GS Acq' at ~100s, 'Exp. 1' (in a green box) at ~400s, 'Overhead' at ~1600s, 'Exp. 2' (in a green box) at ~1800s, 'Pointing Maneuver' at ~3000s, and 'Occultation' at ~3100s. A vertical line at 3100s indicates the end of the observation period. The text 'Unused Visibility = 104' is shown above the timeline.</p>										
	<p>Timeline labels: GS Acq, Exp. 1, Overhead, Exp. 2, Pointing Maneuver, Occultation.</p> <p>Timeline axis: 0, 500, 1000, 1500, 2000, 2500, 3000, 3500, 4000, 4500, 5000, 5500 sec.</p>										

